DATA PROCESSING METHOD, INFORMATION PROCESSING APPARATUS, AND PROGRAM

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a data processing system in which a server apparatus transmits data to a client apparatus, and the client apparatus performs a data process on the basis of the data transmitted from the server apparatus. For example, the present invention relates to a print system in which the server apparatus transmits a form (or a business form) to the client apparatus, and the client apparatus prints the form transmitted by the server apparatus.

Related Background Art

Conventionally, a print system for performing an overlay process is proposed. Here, in the overlay process, form data (i.e., form template data) representing a form image (a business form, a business form template, or the like) and embedding data (i.e., field data) to be embedded in the form data are overlaid (or superposed), and the obtained data is generated as form image data. In the print system of this type, a server apparatus administrates the form data and the embedding data. That is, the server apparatus transmits the form data and the

embedding data as delivery data to the client
apparatus in response to a print request from the
client apparatus. Then, the client apparatus
performs the overlay process to the received delivery
5   data, and actually prints the form based on the
overlay-processed delivery data.

In the above print system, the client apparatus
performs a display process and a print process on the
basis of the delivery data transmitted from the
10   server apparatus, according to control information.
However, it is impossible to cause the client
apparatus to perform a process which is not included
or defined in the control information. Moreover, to
cause the client apparatus to perform a new process,
15   it is necessary to anew define such a new process in
the control information and also remake a program for
the client apparatus so that the client apparatus can
cope with the newly defined process.

20   SUMMARY OF THE INVENTION

The present invention has been made in
consideration of such a conventional problem, and an
object thereof is to provide, so as to be able to
flexibly customize a process to be performed on a
25   client apparatus in a data processing system, a data
processing method which delivers information
necessary to perform a user-defined process from a

server apparatus to the client apparatus, causes the client apparatus to detect the delivered information, and enables the client apparatus to call out the user-defined process from the detected delivered

5 information, an information processing apparatus which adopts the data processing method, and a computer program which is used to achieve the data processing method.

10 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the hardware structure of an information processing apparatus;

Fig. 2 is a view showing the contents of a storage medium storing a control program and relative

15 data thereof;

Fig. 3 is a view showing a memory map of a memory 13;

Fig. 4 is a view showing the functional structure of a network print system;

20 Fig. 5 is comprised of Figs. 5A and 5B showing flowcharts illustrating a process flow; and

Fig. 6 is comprised of Figs. 6A and 6B showing flowcharts illustrating another process flow.

25 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 is a block diagram showing the hardware structure of an information processing apparatus to

be used in a data processing system according to the present invention.

An information processing apparatus 10 is composed of the following sections. That is, an input device 11 is a pointing device such as a keyboard, a mouse or the like. A CPU 12 being a central processing unit controls each of the sections and the processes to be executed in accordance with programs. A memory 13 is a main storage device such as a RAM, a ROM or the like. A display device 14 is a CRT display or the like. An external memory 15 is a storage medium drive (or a storage medium), a hard disk drive (or a hard disk) or the like. An external input/output interface (I/O I/F) 16 which is used to connect with an external network 18 is, for example, a network interface card or the like. A printing device 17 is an image processing apparatus such as a printer, a copying machine, a complex machine, a facsimile apparatus or the like.

The information processing apparatus starts to operate after the CPU performs a data process in accordance with a basic I/O program, an operating system (OS) and other programs. The basic I/O program is stored in the memory 13, and the OS is stored in the external memory 15. When the power of the information processing apparatus is turned on, the OS is read out from the external memory 15 into

the memory 13 by an initial program loading (IPL)
function in the basic I/O program and then a process
by the OS is started.

Fig. 2 is a view showing the contents of a
5   storage medium storing a control program and relative
data thereof according to the present invention.
Volume information, directory information, a control
program execution file and a control program relative
data file are stored in the storage medium. The
10   control program and the relative data thereof are
loaded into the information processing apparatus
through the storage medium drive. When a user
inserts the storage medium into the storage medium
drive, the control program and the relative data
15   thereof are read out from the storage medium under
the control of the OS and the basic I/O program to be
loaded into the memory 13. Thus, a process according
to the control program can be executed.

Fig. 3 is a view showing a memory map of the
20   memory 13. As shown in Fig. 3, the basic I/O program,
the OS and the control program are loaded into the
memory 13. Further, a data area M1, work areas W1 to
W3 are secured in the memory 13.

Although it was explained that the control
25   program and the relative data thereof are directly
loaded into the memory 13 from the storage medium, it
may be constituted that the control program and the

relative data thereof are once stored into a hard disk from the storage medium and then they are loaded into the memory 13. The storage medium may be a Floppy Disk™, a CD-ROM, a DVD-ROM, an IC card memory

5 or the like. Further, a ROM in which the control program is stored may be provided in the information processing apparatus.

Hereinafter, a data processing system (i.e., a network print system) according to the present

10 invention will be explained. Fig. 4 is a view showing the functional structure of the network print system.

A server apparatus 400 is an information processing apparatus having the function of a Web

15 server. The server apparatus 400 has the following function units. That is, a data storage unit 401, which corresponds to a data base or the like, stores data necessary for business. The data stored in the data storage unit 401 is used as field data to be

20 described later. A form (or a business form) storage unit 402 stores form data (or form template data) necessary for generating form image data when a form print is performed. A user-defined data storage unit 403 stores later-described user-defined data.

25 A delivery data generation unit 404 generates data necessary for generating image data and delivery data including the form data on the basis of a

request from a client apparatus. There sometimes is a case that delivery data including the image data is generated upon generating the image data by synthesizing the data stored in the data storage unit 5 401 and the form data. A network communication control unit 405 performs the function of the Web server and controls a network communication.

A client apparatus 410 is an information processing apparatus such as a personal computer (PC) 10 or the like. The client apparatus 410 has the following function units. That is, a data input/output (I/O) unit 411 performs input and output of data for the server apparatus 400 and has the function of a Web browser. A data processing unit 15 412 analyzes the delivery data and reconstructs data necessary for generating the image data, the field data, the form data and the like.

A form temporary storage unit 413 stores the form data reconstructed by the data processing unit 20 412. A form storage unit 414 stores the form data. An image generation unit 415 generates image data by synthesizing the form data and the field data in accordance with a predetermined pattern. The generated image data indicates a form image. A print 25 output unit 416 converts the image data generated by the image generation unit 415 into a data format which can be processed by a printer 430, and is

generally constituted by a program called a printer driver.

A network 440 is a communication medium which enables the server apparatus 400 to communicate with
5   the client apparatus 410. As the network 440, a LAN, an Internet, a radio expedient or the like can be used, and it is desirable that the above network matches with a communication procedure under Web environments.

10   Incidentally, user applications 420 which are activated by the client apparatus 410 executes a process based on the delivery data cooperating with a core module to be described later. The user applications 420 execute a user-defined data process,
15   a form data process, a field data process, an image data generation process, a print output process and another user-defined event process in accordance with an issued event.

Fig. 5 is comprised of Figs. 5A and 5B showing
20   flowcharts illustrating a flow of a more concrete process.

In this process, the user applications 420 are formed by an execution format file (EXE) and the core module is constituted as a dynamic link library
25   format component. Further, a password certification execution program (password.exe) is embedded as the user-defined data in the delivery data by the server

apparatus 400.

When a web server of the client apparatus 410 accesses to a web page in which information used for issuing a form is embedded, the delivery data is transmitted from the server apparatus 400 to the client apparatus 410 (step S501). When the delivery data is received, the web browser activates an execution program corresponding to the MINE type registration of the delivery data (step S502).

In the present embodiment, the user applications are previously installed in the client apparatus 410 to be associated with the MINE type of the delivery data. Accordingly, the user applications 420 are activated.

When the user applications 420 are activated, the core module is initially loaded (step S601). In the core module, a delivery data analysis process for analyzing the delivery data, a form display process and a form printing process are installed. When the loading of the core module ends, all the event processes executed to the user applications are successively registered in the core module (step S602). On the other hand, in an event administration mechanism of the core module, an event and an event process reading destination (program) corresponding to the event are correspondingly registered (step S701). In the present embodiment, the included event

process is an event process (user-defined data
detection event) of detecting the user-defined data.

After registering the event process, the user
application calls out the delivery data analysis

5   process of the core module (step S603). Thereupon, a
control process is shifted within the core module and
then an analysis process of the delivery data is
started.

In the first of the analysis process of the

10   delivery data, it is judged whether or not the user-
defined data is included in the delivery data (step
S801). If it is judged that the user-defined data is
included, the core module issues a user-defined data
detection event and sends the user-defined data to a

15   processing destination (step S802). The event
administration mechanism recognizes that the user-
defined data detection event was issued and judges
whether or not the user-defined data detection event
is registered. If the user-defined data detection

20   event is registered, an event process corresponding
to the user-defined data detection event is judged
(step S702). In these steps, a program corresponding
to the user-defined data detection event is assumed
as the user application.

25   In a case where the user-defined data detection
event is registered and the user application
corresponds to the user-defined data detection event,

the user-defined data is sent to the user application
and then a control process is shifted to the user-
defined data process within the user application. In
the user-defined data process, it is recognized that
the user-defined data is an execution program. This
condition depends on a fact that the specification
between a developer of an embedding process of the
user-defined data and a developer of the user
application is predetermined. Therefore, a title is
given to the user-defined data to store it as a file
(password.exe) and then the user-defined data is
activated (step S604).

In the present embodiment, since the file
"password.exe" is embedded as the user-defined data,
the password certification execution program
(password.exe) is activated. The password
certification execution program initially displays a
screen of requiring an input of the password (step
S901).

When a user inputs the password (step S902), it
is judged whether or not the password is correct
(step S903) and then the judged result is sent to the
user application (step S904). In this time, a
process of sending a true/false value as an end code
to an original activation parent program is executed.

In the user-defined data process, the judged
result is received (step S605), and the contents of

the judged result is judged (step S606). When the
user inputs a correct password (in a case that an end
code is "TRUE"), the user-defined data process ends,
and then a control process is sent to the core module.

5   When the user inputs an incorrect password (in a case
that an end code is "FALSE"), a flow advances to a
step S611 shown in Fig. 6A.

Subsequently, it is judged whether or not the
form data is included in the delivery data (step

10   S803). If the form data is included, a form data
detection event is notified and then the form data is
sent to a processing destination (step S804). The
event administration mechanism judges whether or not
the form data detection event is registered, and if

15   the form data detection event is registered, an event
process corresponding to the form data detection
event is judged (step S703). In a case where the
form data process is registered corresponding to the
form data detection event, the form data process is

20   executed (step S607).

Similarly, it is judged whether or not the
field data is included in the delivery data (step
S805). The field data is such data which is
synthesized on a predetermined position of the form

25   data. If the field data is included, a field data
detection event is notified and then the field data
is sent to a processing destination (step S806). The

event administration mechanism judges whether or not the field data detection event is registered, and if the field data detection event is registered, an event process corresponding to the field data

5 detection event is judged (step S704). In a case where the field data process is registered corresponding to the field data detection event, the field data process is executed (step S608).

When an analysis process ends, a control

10 process is shifted from the core module to the user application. Thereupon, the user application calls out a print process of the core module (step S609). Then, the print process of the core module is started.

In the print process, an event concerning a

15 previously defined print is issued (step S807). The event administration mechanism judges whether or not the issued event is registered, and if the issued event is registered, an event process corresponding to the issued event is judged. As for the event

20 process, there is an image data generation process or a print output process (step S610). The image data generation process causes the image generation unit 415 to generate image data by controlling the image generation unit 415. The print output process causes

25 the print output unit 416 to transmit print data to the printer 430 by controlling the print output unit 416.

When a print process ends, a control process is shifted from the core module to the user application, the user application unloads the core module (step S611), and then the process ends.

5   As explained in the foregoing wherein the "password.exe" was activated, various programs can be activated in the client apparatus by designating an execution program by using the user-defined data. This fact is an example of indicating flexibility of

10   a system which can be realized by the present invention.

That is, as to the application software once forwarded and distributed, an operation of the application software installed in lots of client

15   apparatuses can be customized after forwarding and distributing the application software.

According to the present invention, in an information processing apparatus which executes a data process on the basis of data from an external

20   information processing apparatus, with respect to the data process to be executed in the information processing apparatus, for example, an operation of the application program already installed in the information processing apparatus can be easily

25   customized.

In an information processing apparatus which executes a print process on the basis of data from

the external information processing apparatus, with respect to the data process to be executed in the information processing apparatus, for example, an operation of the application program already installed in the information processing apparatus can be easily customized for the print process.

In the information processing apparatus which executes the data process on the basis of data from the external information processing apparatus, even if a program used for certifying a password is not provided in the information processing apparatus, with respect to the data process to be executed in the information processing apparatus, for example, a password certification can be executed by customizing an operation of the application program already installed in the information processing apparatus.